

Appl. No. 10/661,793
Amdt. dated 07/24/2007
Response to Office Action of 04/30/2007

Attorney Docket No.: TS01-1037
N1085-90149

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REMARKS/ARGUMENTS

Claims 8-17 were previously pending in this application. Claims 12-14 have been allowed and claims 8-11 and 15-17 rejected. Claim 8 is hereby amended. Applicants respectfully request re-examination, reconsideration and allowance of each
5 of pending claims 8-11 and 15-17 in addition to previously-allowed claims 12-14.

Applicants and their undersigned representative thank the Examiner for the detailed analysis, comments and figures from the referenced documents that were embedded in the Office Action and which proved very helpful.

I. Allowable Subject Matter

10 Applicants further thank the Examiner for indicating, in paragraph 4 of the Office Action, that claims 12-14 have been allowed.

II. Rejection of Claims 8-11 and 15-17 Under 35 U.S.C. § 102(e)

In paragraph 3 of the Office Action, claims 8-11 and 15-17 were rejected under 35 U.S.C. § 102(e) as being anticipated by Mui et al. (U.S. Pat. No. 6,924,088),
15 hereinafter "Mui". Applicants respectfully submit that the present claim rejections based on the Mui reference are overcome for reasons set forth below.

Claims 8-11 and 15-17 are distinguished from Mui because each of these claims includes the feature of a feedback mechanism that assures that the obtained critical dimension measurement of an opening formed in an etch resist material. The feedback
20 mechanism communicates with the means for creating the opening through the layer of etch resist material for the purpose of controlling the critical dimension (CD) in the etch resist material. In particular, independent claim 8 recites the features of:

25 means, including a feedback mechanism, for assuring that the obtained critical dimension measurement of said opening created through said layer of etch resist material is within design specification, said feedback mechanism communicating with said means for creating an opening

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through a layer of etch resist material to control said critical dimension measurement of said opening.

Independent claim 15 recites the features of:

5 means, including a feedback mechanism, for obtaining a critical dimension measurement of said opening created through said layer of etch resist material and assuring that said critical dimension measurement is within design specification, said feedback mechanism communicating with said means for creating an opening through a layer of etch resist material to control said critical dimension measurement of said opening.

Independent claim 16 similarly recites the features of:

15 means, including a feedback mechanism, for creating an opening through a layer of etch resist material provided over the surface of a layer of insulating material having been deposited over the surface of a substrate, such that the opening has a critical dimension measurement that is within design specification, said feedback mechanism communicating with said means for creating an opening through a layer of etch resist material to control said critical dimension measurement of said opening;

In contrast, Mui is directed to the feedback mechanism communicating with means for adjusting the dimensions of an already-created opening in the etch resist material, not with the means for CREATING the opening in the etch resist material. In
25 col. 9, lines 5-44 of Mui [col. 9, lines 11-44 were proffered in the Office action as the section of Mui that teaches communication with the means for creating an opening to a layer of etch resist material 250], Mui addresses and is limited to adjusting the etch recipe or the trim recipe, not a system that creates the opening through the etch resist material.

30 If the etch recipe is adjusted, the measured CD of the opening in the etch resist material is not controlled: rather, the etch recipe is adjusted to compensate for the etch resist layer opening that may be out of the desired range. Clearly, if the etch recipe is

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adjusted based on CD deviations, this does not satisfy the limitation of a feedback mechanism communicating with the means/system that CREATES the opening through the layer of etch resist material and it does not satisfy the limitation of controlling the etch resist CD. In fact, quite the opposite is true: the etch resist CD is accepted as-is,
5 and the etch recipe is adjusted to compensate accordingly.

If the CD deviations are used to adjust the trim operation (the other option in Mui), this also does not satisfy the limitation of communicating with the means for CREATING the opening through a layer of etch resist material because the trim operation, as known to one of ordinary skill in the art, modifies the dimension of an
10 already-created feature such as an opening. The trim operation is also not a system/means that CREATES an opening in the layer of etch resist material.

Mui, in fact, is entirely directed to changing parameters of the trim process and/or the etch process and at no time teaches a feedback mechanism that communicates with the means for CREATING the opening in the etch resist material. In the paragraph
15 immediately after the title "Detailed Description", Mui provides that CD measurements are made and the information is fed forward to the next process, not to the operation that creates the opening: *The present invention addresses the problem of CD and micro loading control by reducing CD variation by feeding forward information relating to photoresist mask CD and profile to adjust the next process the inspected wafer will*
20 *undergo (e.g., the photoresist trim process and subsequent etch processes), col. 4, lines 35-40.*

In summary, since Mui does not recite the feature of a feed forward system/means, based on measured CD's communicating with a system that creates an opening in the etch resist layer and since Mui also does not provide a feedback
25 mechanism that controls the etch resist CD, each of independent claims 8, 15 and 16 are distinguished from Mui. (Claim 8 was amended to correct a previously existing typographical error.) Claims 9-11 depend from claim 8 and claim 17 depends from claim 16. These dependant claims are similarly distinguished from Mui and therefore

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the rejection of claims 8-11 and 15-17 as being anticipated by Mui, should be withdrawn.

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CONCLUSION

Based on the foregoing, each of claims 8-17 is in allowable form and the application is therefore in condition for allowance, which action is respectfully and expeditiously requested.

- 5 The Assistant Commissioner for Patents is hereby authorized to charge any fees necessary to give effect to this filing or credit any excess payment that may be associated with this communication, to Deposit Account 04-1679.

Respectfully submitted,

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Dated: July 24, 2007

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